



# AV-TEK®

VALVES THAT REDEFINE INDUSTRY STANDARDS



## Wastewater **Combination Air Valve** **Model 5500**

The 5500 series air valve guarantees the proper operation of sewage lines allowing the entrance and the discharge of large volumes of air, during pipe draining and filling operations, and the release of air pockets during working



## TECHNICAL FEATURES AND BENEFITS

- Large lower body designed with strongly sloped funnel shaped walls to avoid deposit of grease or other material, and containing four ribs obtained by casting to guide the stainless steel float.
- Upper body containing a casing that protects the air release device against spurts during rapid filling.
- Mobile block including a large AISI 316 stainless steel float, placed on the lower body, and connected through a stainless steel rod to the air release system.
- Flat obturator in solid polypropylene to avoid deformations and to prevent it from remaining stuck to the gaskets, while other materials have the tendency to do it.
- Drainage valve for chamber control and draining.
- Nozzle and gasket holder (patent pending) wear resistant thanks to gasket compression control.
- Maintenance can be easily performed from the top without removing the air valve from the pipe.
- Threaded outlet available.

## APPLICATIONS

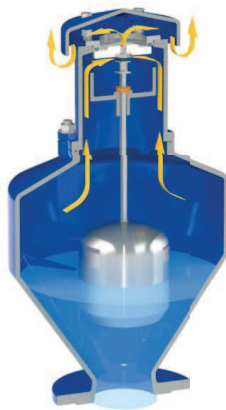
- Sewage main transmission lines.
- Treatment plants.
- Irrigation systems in presence of solids/debris in suspension.
- Whenever the technology of air valves for treated water can't be used for the risk of clogging and damages to the internal components.

# OPERATING PRINCIPLE



## Discharge of large volumes of air

During the pipe filling it is necessary to discharge air as liquid flows in. The 5500, thanks to an aerodynamic body and deflector, will make sure to avoid premature closures of the mobile block during this phase.



## Air release during working conditions

During operation the air produced by the pipeline is accumulated in the upper part. Little by little it is compressed and its volume increases, pushing the liquid level downwards and allowing the air release through the nozzle.



## Entrance of large volumes of air

During pipeline draining, or pipe bursts, it is necessary to bring in as much air as the quantity of outflowing liquid. This is to avoid negative pressure and serious damages to the pipeline and the entire system.

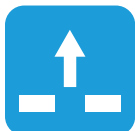
## OPTIONAL



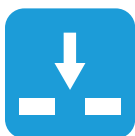
**Vacuum breaker version** to allow the entrance and discharge of large volumes of air only. This model is normally recommended on changes in slope ascending, long ascending segments, and wherever the air release won't be required.



**Version for submerged applications, SUB series**, standard for 2"/2.5" with an elbow for air conveyance. The design sprang from the necessity of having an air valve performing also in case of flood, without the risk of contaminated water entering the pipeline. Another benefit of SUB is to avoid the spray effect, conveying spurts coming from the rapid closure of the air valve.

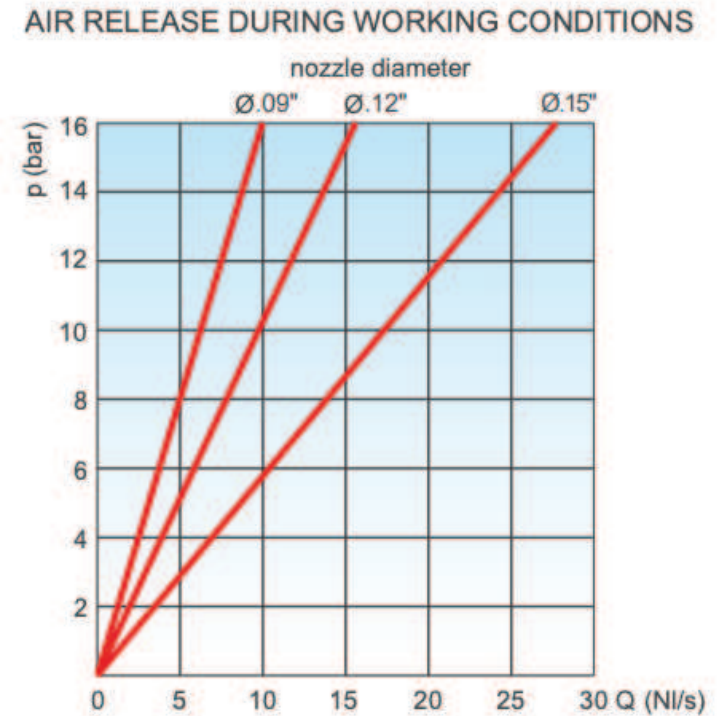
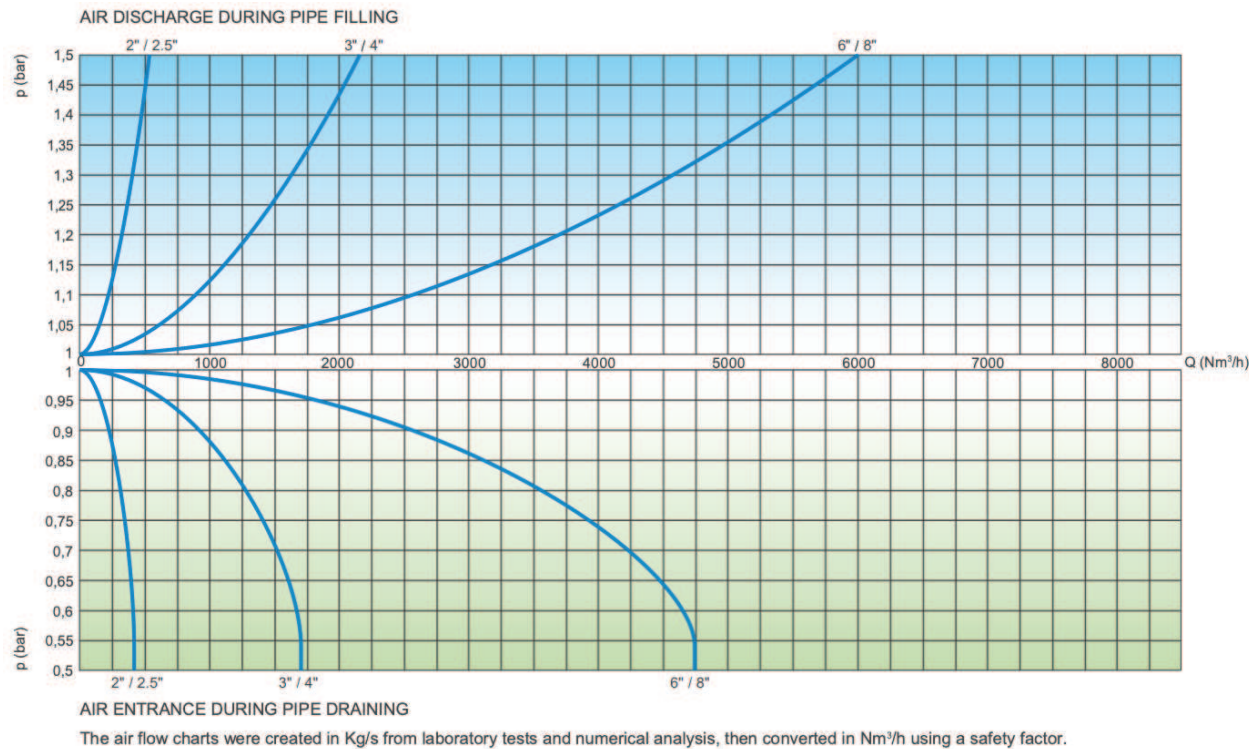


**Version for air discharge only E0 series** (on request). The most important application of E0 is to allow the air valve installation in those locations of the system where Hydraulic Grade Line may drop below the pipe profile, and to any other node where for project requirements air entrance must be avoided.



**Version for air entrance only IO series**, available for vacuum breaker model. The most important application of IO is to allow the air valve installation in those locations of the system where, for project requirements, air discharge and release must be avoided.





## WORKING CONDITIONS

Water and waste water max. 284°F.  
Maximum pressure 250 psi.  
Minimum pressure 3 psi. Lower on request.  
Higher temperatures on request.

## NOZZLE CHOICE

Nozzle diameter in inches according to the size of the air valve and pressure rating.

	150 psi	250 psi
2" / 2.5"	.09"	.09"
3" / 4"	.12"	.12"
6" / 8"	.15"	.15"

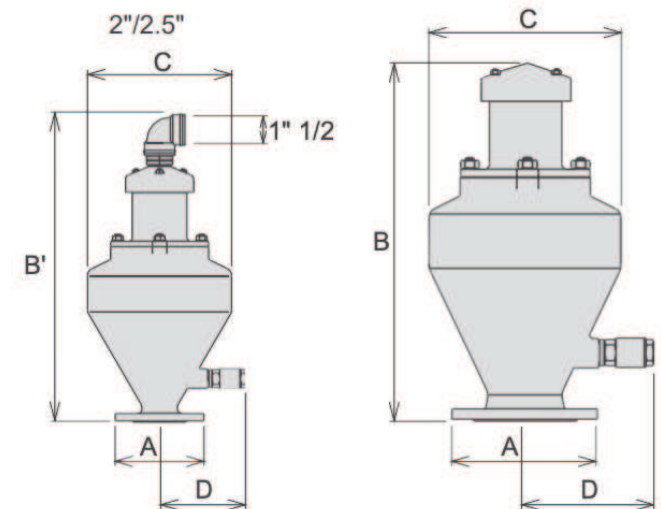
## STANDARD

Certificated and tested in compliance with EN-1074/4.  
Flanges according to EN 1092/2.  
Epoxy painting applied through fluidized bed technology blue RAL 5005.  
Changes on the flanges and painting details available on request.

## WEIGHTS AND DIMENSIONS

DN mm	A	B	B'	C	D	Weight
2"/2.5"	7.25"	-	25.5"	11.75"	7.5"	64
3"/4"	8.66"	23.62"	-	13.75"	8"	88
6"	11.25"	33.5"	-	19.25"	9.5"	172
8"	13.38"	33.5"	-	19.25"	9.5"	182

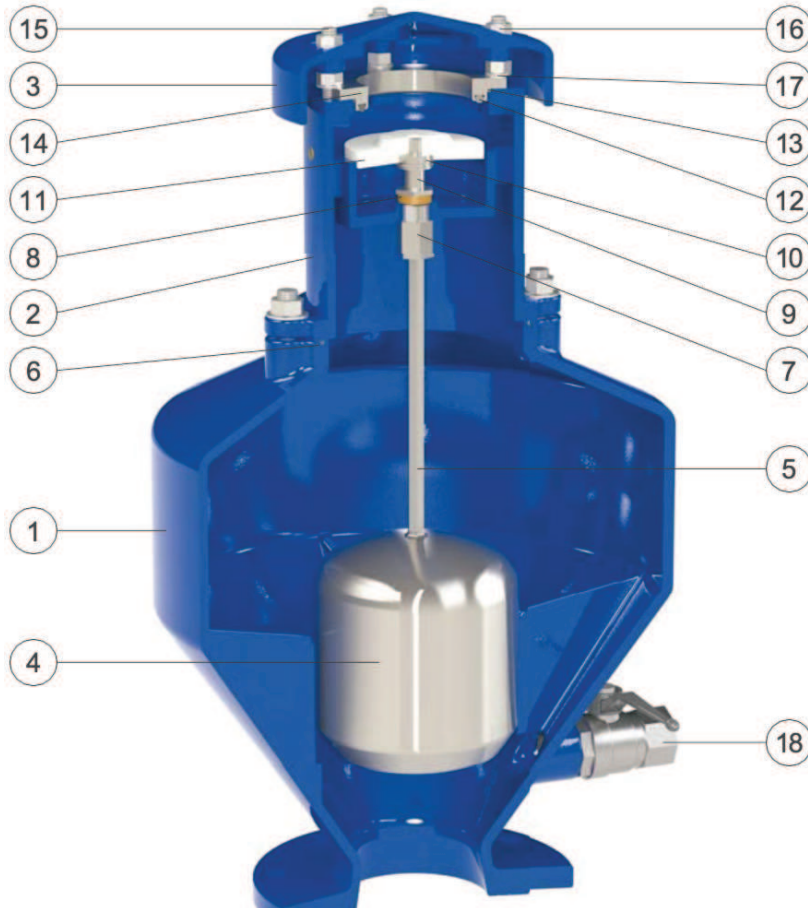
All values are approximate, consult Av-Tek service for more details.



# TECHNICAL DETAILS

P.No	Part Name	Material
1	LowerBody	Ductile Cast Iron GJS 500-7 or GJS 450-10
2	Upper Body	Ductile Cast Iron GJS 500-7 or GJS 450-10
3	Cap	Ductile Cast Iron GJS 500-7 or GJS 450-10
4	Float	Stainless Steel AISI 316
5	Float Shaft	Stainless Steel AISI 316
6	O-Ring	NBR (EPDM/Viton/Silicone Optional)
7	Driving Sleeve	Stainless Steel AISI 303 (Stainless Steel AISI 316 Optional)
8	Plane Gasket	NBR
9	Gasket Holder	Stainless Steel AISI 316

P.No	Part Name	Material
10	Nozzle Subset	Stainless Steel AISI 316
11	Obturator Flat	Polypropylene
12	Seat Gasket	NBR (EPDM/Viton/Silicone Optional)
13	O-ring	NBR (EPDM/Viton/Silicone Optional)
14	Seat	Stainless Steel AISI 304 (AISI 303 for 2"/2.5") (Stainless Steel AISI 316 Optional)
15	Studs	Stainless Steel AISI 304 (Stainless Steel AISI 316 Optional)
16	Nuts	Stainless Steel AISI 304 (Stainless Steel AISI 316 Optional)
17	Washer	Stainless Steel AISI 304 (Stainless Steel AISI 316 Optional)
18	Ball Valve 1"	Stainless Steel AISI 316



Threaded PP evacuation bend 1" 1/2 supplied as a standard for 2"/2.5".

## SUBCOMPACT VERSION 2" ONLY

The air valve guarantees the proper operation of sewage lines allowing the entrance of a large quantity of air in case of pipe burst or draining, the release of air pockets during working conditions and the discharge during pipe filling.



## TECHNICAL FEATURES AND BENEFITS

- Lower body designed with strongly sloped funnel shaped walls to avoid deposit of grease or other material, it contains four ribs to guide the stainless steel float.
- Upper body containing the air release device which is protected by a stainless steel deflector against spurts caused by rapid filling.
- Mobile block, including a large AISI 316 stainless steel float, placed on the lower body and connected through a stainless steel rod to the air release mechanism.
- Compact and light, the 5500 2" features an innovative technology making it suitable even to the most demanding environments.
- Drainage valve for chamber control and draining.
- Maintenance can be easily performed from the top without removing the air valve from the pipe.
- Evacuation bend suitable for flooded environments with 1" elbow outlet.

## APPLICATIONS

- Sewage main transmission lines.
- Treatment plants.
- Irrigation systems in presence of solids/debris in suspension.
- Whenever the technology of air valves for treated water can't be used for the risk of clogging and damages to the internal components.

# OPERATING PRINCIPLE



## Discharge of large volumes of air

During the pipe filling it is necessary to discharge air as liquid flows in. Thanks to an aerodynamic body and deflector, will make sure to avoid premature closures of the mobile block during this phase.



## Air release during working conditions

During operation the air produced by the pipeline is accumulated in the upper part. Little by little it is compressed and its volume increases, pushing the liquid level downwards and allowing the air release through the nozzle.



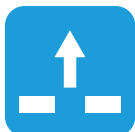
## Entrance of large volumes of air

During pipeline draining, or pipe bursts, it is necessary to bring in as much air as the quantity of outflow-ing liquid. This is to avoid negative pressure and serious damages to the pipeline and the entire system.

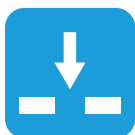
## OPTIONAL



**Vacuum breaker version**, to allow the entrance and discharge of large volumes of air only. This model is normally recommended on changes in slope ascending, long ascending segments, and wherever the air release won't be required.



**Version for air discharge only** (on request). The most important application of EO is to allow the air valve installation in those locations of the system where HGL may drop below the pipe profile, and to any other node where for project requirements air entrance must be avoided.



**Version for air entrance IO series**, available for vacuum breaker model only. The most important application of IO is to allow the air valve installation in those locations of the system where, for project requirements, air discharge and release must be avoided.

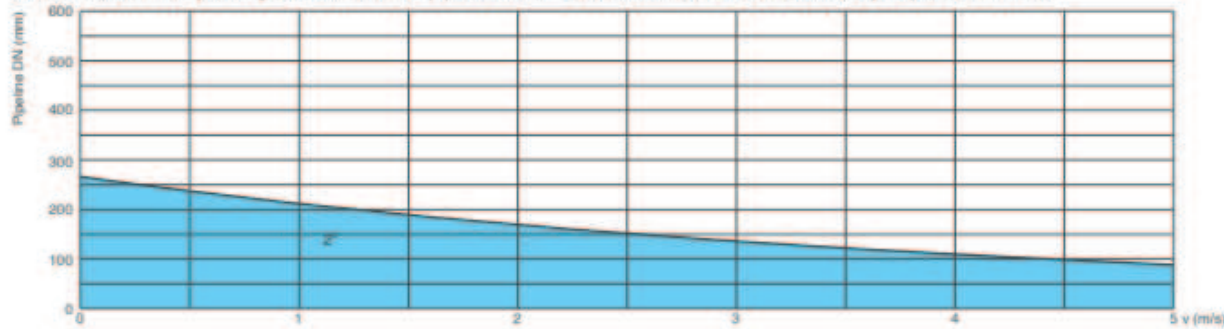


# TECHNICAL DATA

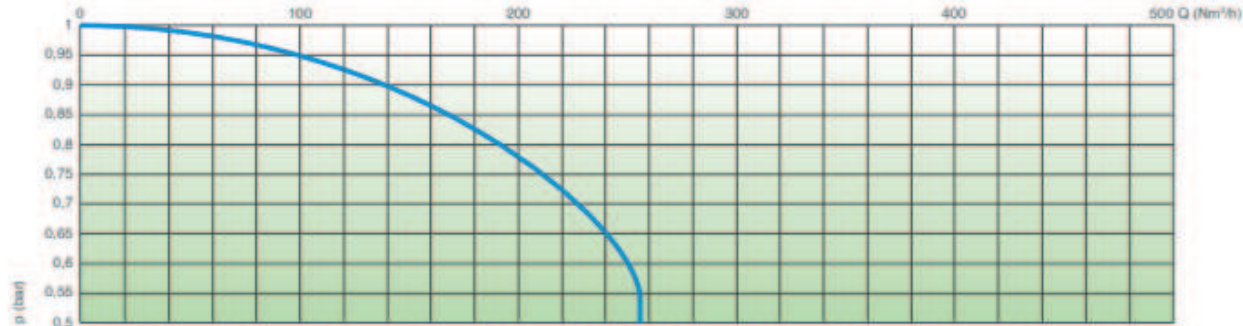
# AIR FLOW PERFORMANCE CHARTS

## Air valve selection chart

Air valve preliminary sizing as a function of pipeline internal diameter and fluid flow velocity expressed in m/s.



## Air flow performance chart



### AIR ENTRANCE DURING PIPE DRAINING

The air flow charts were created in Kg/s from laboratory tests and numerical analysis, then converted in Nm³/h using a safety factor.

## WORKING CONDITIONS

Water and waste water max. 140°F.  
Maximum pressure 250 PSI.  
Minimum pressure 3 PSI. Lower on request.

## STANDARD

Certified and tested in compliance with EN-1074/4. Manufactured with 2" NPT inlet; supplied on request with ANSI 150 flanges. Epoxy painting applied through fluidized bed technology and is painted blueRAL 5005. Changes on the flanges and painting details available on request.

## NOZZLE CHOICE

Nozzle diameter in mm according to the size of the air valve and the PN.

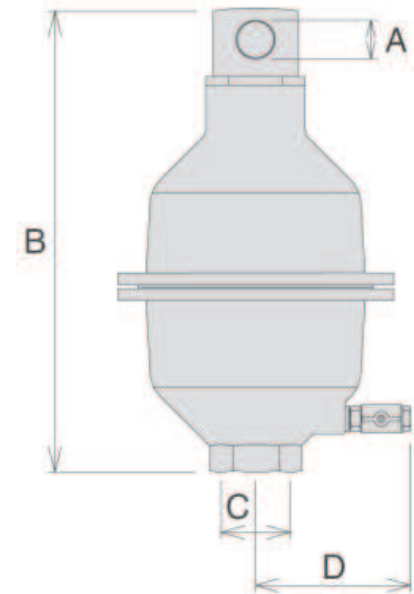
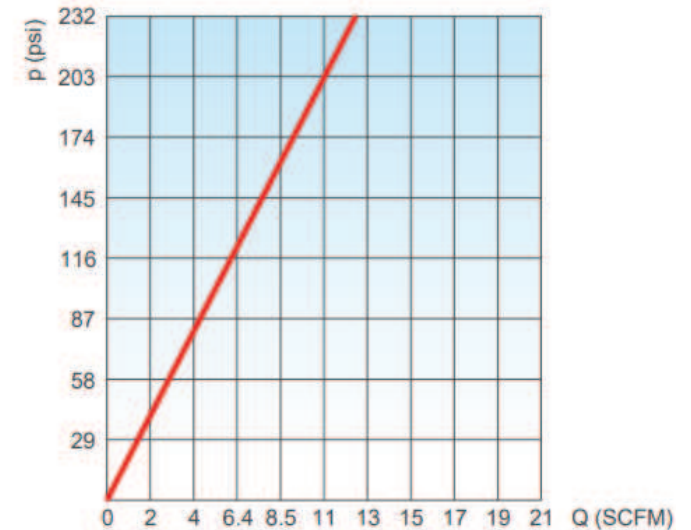
150 PSI	250 PSI
1/32	1/32

## WEIGHTS AND DIMENSIONS

C inch	A inch	B inch	D inch	Main orifice in <sup>2</sup>	Nozzle orifice	Weight lbs
2"	1"	15"	5.4"	.75"	1/32	23

All values are approximate, consult Av-Tek service for more details.

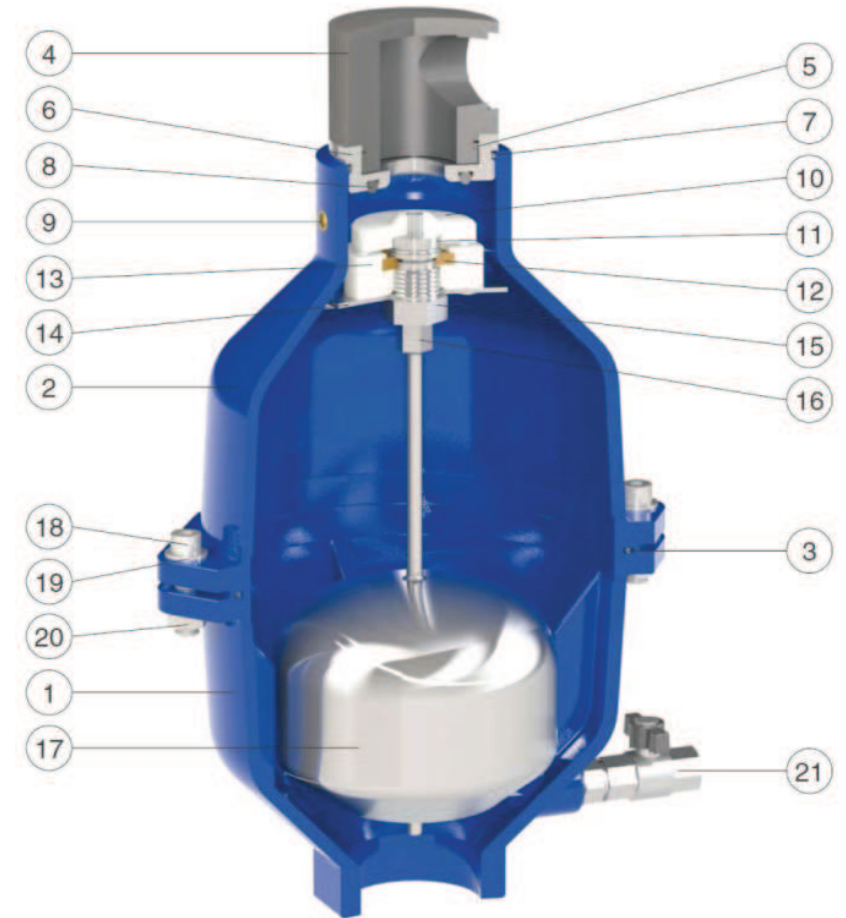
## AIR RELEASE DURING WORKING CONDITIONS





# TECHNICAL DETAILS

P.No	Part Name	Material
1	Lower Body	Ductile Iron GJS 500-7 or GJS 450-10 (316 Stainless Steel Optional)
2	Upper Body	Ductile Iron GJS 500-7 or GJS 450-10 (316 Stainless Steel Optional)
3	O-ring	NBR (EPDM/Viton/Silicone Optional)
4	Cap	PVC
5	O-ring	NBR (EPDM/Viton/Silicone Optional)
6	Seat	Stainless Steel AISI 316
7	O-ring	NBR (EPDM/Viton/Silicone Optional)
8	Seat Gasket	NBR (EPDM/Viton/Silicone Optional)
9	Plug	Brass (Stainless Steel AISI 316)
10	Obturator	Polypropylene
11	Nozzle Subset	Stainless Steel AISI 316
12	Plane Gasket	NBR
13	Lower Gasket Holder	Polypropylene
14	Deflector	Stainless Steel AISI 316
15	Guiding Nut	Stainless Steel AISI 316
16	Upper Gasket Holder	Stainless Steel AISI 316
17	Float	Stainless Steel AISI 316
18	Screws	Stainless Steel AISI 304 (Stainless Steel AISI 316 Optional)
19	Washers	Stainless Steel AISI 304 (Stainless Steel AISI 316 Optional)
20	Nuts	Stainless Steel AISI 304 (Stainless Steel AISI 316 Optional) v
21	Drain Valve	Stainless Steel AISI 316



# ANTI-SHOCK OPTION



## Entrance of large volumes of air

During pipeline draining, or pipe bursts, it is necessary to bring in as much air as the quantity of outflowing liquid. This is to avoid negative pressure and serious damages to the pipeline and the entire system.



## Controlled air discharge

During the pipe filling it is necessary to avoid rapid closures of the mobile block, responsible of water hammer effects. The SCA 2" will control the air outflow reducing the water approach velocity and thus minimizing the risk of overpressure.

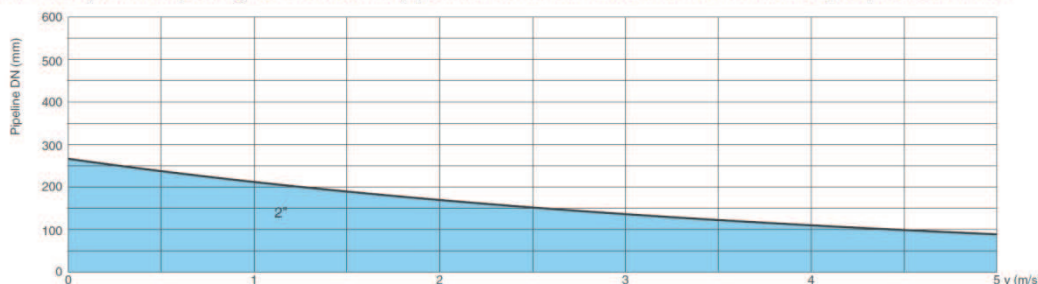


## Air release during working conditions

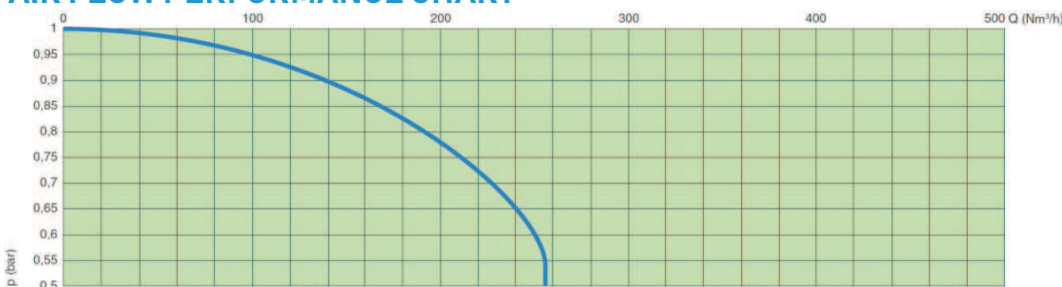
During operation the air produced by the pipeline is accumulated in the upper part. Little by little it is compressed and its volume increases, pushing the liquid level downwards and allowing the air release through the nozzle.

## AIR VALVE SELECTION CHART

Air valve preliminary sizing as a function of pipeline internal diameter and fluid flow velocity expressed in m/s



## AIR FLOW PERFORMANCE CHART



## AIR ENTRANCE DURING PIPE DRAINING

The air flow charts were created in Kg/s from laboratory tests and numerical analysis, then converted in Nm<sup>3</sup>/h using a safety factor.



Av-Tek's anti-slam wastewater air valves can be installed on the pump riser, just upstream of the check valve. When the pump is idle, the riser will be filled with air, down to the water level in the sump. The air valve is needed to avoid at any time the onset of negative pressure, yet assuring a controlled air venting when pump is operated. This is achieved by means of Av-Tek's antislam device and is extremely important to avoid pump overload and water hammer events, otherwise generated during abrupt closures caused by rapid water approach velocity and uncontrolled filling of the pump's raiser.

## ADVANCED TESTING FACILITIES

Designed to reproduce real conditions of modern water distribution systems at our testing facility is able to assess the dynamic performances of automatic control valves, direct acting pressure control valves, air valves and anti water hammer valves.

Provided with a high capacity booster pumps station, and linked to an advanced high frequency pressure transducers and flow meters, the testing rig allows for a real time visualization of pressure and flow evolutions. Water hammer events can also be simulated and recorded to prove the efficacy of Av-Tek fast acting relief valve, in addition to level control for which, using an auxiliary stilling tank, a part of the pipeline system is entirely dedicated.

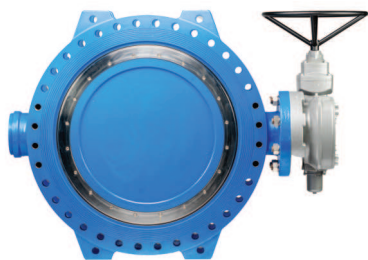
The PLC and control station allows for the operation of step by step and solenoid operated valves to determine the sensitivity of such kind of application and pressure management solutions. Thanks to this important and powerful tool valves can be customized, simulated and set according to the project requirements assuring the perfect performance and accuracy.

## THE TESTING PROCESS

All our valves undergo severe tests according to European standards to ensure they are mechanically resistant, watertight, and high performing. After testing every valve is identified by means of a metallic tag or sticker, and duly registered and certified.







Av-Tek® Inc. offers modern solutions for the persistent problems facing water users, plant operators, and engineering firms. Our technology far exceeds the current options in the marketplace, and clients are quickly realizing Av-Tek® is setting a new standard for quality, performance, and craftsmanship.

The Av-Tek® DEX double eccentric butterfly valve is a primary example of superior design and quality. Exceeding the requirements of AWAA C504, this valve simply just works, even years down the road, you can rest assured there is not a better valve on the market today.

The Av-Tek® VRX Plunger Valve has been engineered and designed for absolute control; specifically, for water applications. The VRX accompanied with an electric motor operator can function as a critical isolation, pressure, and control valve without the fear of cavitation damage.

The Hydrant Air Exhaust or HAX, is a patent pending device that allows you to make your system more efficient by removing the air out of your lines, and easily checking line pressure through any fire hydrant!

The Av-Tek® Model 4900 Ball Check Valve has a 100% opening port, there is virtually no head loss when the valve is fully open. Ball Check Valves are a resilient seated check valve used in wastewater lift stations. Different weighted balls allow for this to be adjusted to your application.

The Av-Tek® Resilient Seated Butterfly Valves are a crucial part of nearly every application, and the advanced design allows for quick replacement of seats.